



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1459
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,251	09/23/2005	Johannes Menzel	MENZEL-1 (PCT)	1892
25889 7590 02/12/2009 COLLARD & ROE, P.C. 1077 NORTHERN BOULEVARD ROSLYN, NY 11576				
EXAMINER WU, IVES J				
ART UNIT		PAPER NUMBER		
1797				
MAIL DATE		DELIVERY MODE		
02/12/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/550,251

Applicant(s)

MENZEL, JOHANNES

Examiner

IVES WU

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 5, 6, 8 and 9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9 is/are allowed.
- 6) ☐ Claim(s) 1-2, 5-6, 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/92)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

(1). Applicant's Amendments and Remarks filed on 11/28/2008 have been received.

Claim 1 is amended. Claims 3-4 and 7 are cancelled.

New claims 8 and 9 are added.

The 112 2nd rejection of claims 1-7 in prior Office Action dated 9/11/2008 is withdrawn in view of the current Amendments.

Also, the 112 2nd rejection of claim 4 in prior Office Action dated 9/11/2008 is withdrawn in view of the current Amendment.

The rejections of claims 1-7 in prior Office Action dated 9/11/2008 is withdrawn in view of the current Amendment.

However, a new ground of rejection for claims 1-2, 5-6 and 8-9 is introduced in the following.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

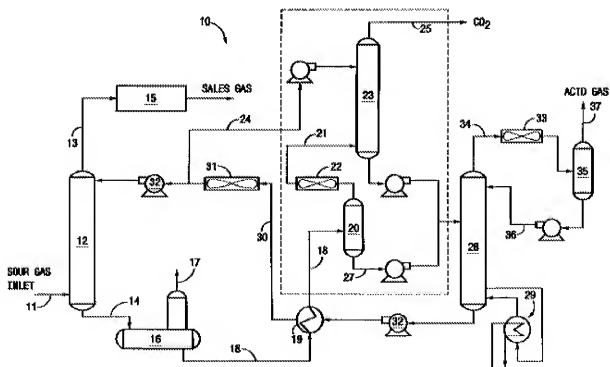
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(2). **Claims 1-2, 5-6 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Marjanovich et al (US 5820837A) in view of Khanmamedov (US 6506349B1) further in view of Sweny et al (US 3877893), evidenced by Ameen (US 3594985).

As to method for selective removal of hydrogen sulphides, organic sulphur components and CO₂ from crude gases by using 1st absorption stage and 2nd absorption stage for separating almost pure CO₂ and using a desorption stage for extracting a gas rich in hydrogen sulphide, whereby the regenerated absorbing substance from the desorption stage is again guided back to both the absorption stages in **independent claim 1**, Marjanovich et al (US05820837A) disclose process for treating a gas stream to selectively separate acid gases therefrom (Title). In particular, it relates to a sour gas treatment method which includes processing the acid gas removed from the sour gas to recover high-quality CO₂, and to improve the quality (i.e. concentration of H₂S) in the acid gas stream while reducing the total volume of the acid gas stream which is subsequently processed to recover sulphide (Col. 1, line 19-25). As illustrated in the Figure below which show a 1st absorber 12, 2nd absorber 23, line 25 almost substantially H₂S free CO₂, regeneration unit 28, acid gas exit line 34 passed from top of stripper 28, recovered in line 37, and regenerated absorbent feeds to both absorbers through line 30.



As to absorbing substance one uses a chemically non-active solvent in **independent claim 1**, Marjanovich et al (US05820837A) disclose solvent of an organic amine (Abstract, line

2). More specifically, the solvent is preferably a liquid amine mixture which is basically comprised of approximately 50% MDEA and 50% of water (Col. 4, line 27-29). Marjanovich et al **do not teach** the use of a chemically non-active solvent as claimed.

However, Khanmamedov (US06506349B1) **teaches** process for removal of contaminants from gas stream (Title). A selected contaminant is removed from a gas stream containing an unselected component that is also absorbed by the solvent, although a lesser degree than the selected contaminant (Abstract, line 1-4). Either physical solvents, such as water, propylene carbonate or methyl cyanoacetate, or chemical solvents, such as monoethanol amine (MEA), diethanol amine (DEA) or N-methyldiethanol amine (MDEA) can be used for such process (Col. 4, line 4-8).

In view of substantially identical solvents MDEA and physical solvent disclosed by Khanmamedov for acid gas removal. It would have been obvious at time of the invention to use the physical solvent of Khanmamedov instead of organic amine in the process of Marjanovich et al based on their interchangeability as recognized functional equivalence as solvent in acid gas removal process.

As to the absorption agent enriched with hydrogen sulphide, organic sulphur compounds and CO₂ and coming out of the 1st absorption stage to find itself at an increased pressure between the pressure of absorption column and the pressure of the desorption column in method in **independent claim 1**, as shown in the Figure 1, the rich solvent from the contactor vessel 12 in the line 14 would inherently having a increased pressure between the pressure of absorption column and the pressure of the desorption column.

As to step of being preheated with hot-regenerated solution coming from the desorption stage in a heat exchanger in method in **independent claim 1**, as shown in the Figure above, the heater 19, regenerated solution line 30, which read on the limitation of instant claim.

As to step of being de-stressed at a selected pressure greater than the increased pressure in a high pressure flash container (47) in method in **independent claim 1**, as shown in Figure above, the flash tank 20 which is operated at very low pressure (e.g. less than about 25 psig) (Col. 4, line 65-67) which is also used as high pressure flash tank as evidenced by Ameen (US03594985) the high pressure flash tank 7 operating at pressure of 25 to 600 psia (Col. 4, line 40-41).

As to whereby the gas flow released at the increased temperature being cooled in a condenser (48) and then guided to the 2nd absorption stage (40) in which the sulphur components are completely removed with the help of the part-flow the regenerated absorption agent coming from the desorption stage in method in **independent claim 1**, as shown in Figure above, the cooler 22 and line 21 to the 2nd absorber 23, and part-flow of regenerated absorbent line 30, CO₂ exit line 25 (substantially H₂S free) which read on the limitations of instant claim.

As to the absorption agent being guided back out of the 2nd absorption stage into the desorption stage in method in **independent claim 1**, as shown in Figure above, at bottom of 2nd absorber, one line (not numbered) is guided to stripper 28.

As to wherein after the 2nd absorption stage (49) a flash stage (55) is foreseen, in which the charged absorbing substance is released out of the 2nd absorption stage and the thus released flash gas (19) which primarily contains CO₂ and portions of H₂S, is led into a pipeline at least indirectly leading to the leading absorption substance stage, and the absorbing substance (26) is guided into the desorption stage in the method in **independent claim 1**, Marjanovich et al (US 5820837A) **do not teach** the flash stage after the 2nd absorber 23 and guide the released gas back to absorption stage, absorbing substance is guided into the desorption stage as claimed.

However, Sweny et al (US 3877893) **teach** absorption and separation of normally liquid gas contaminants (Title). As is illustrated in the Figure below, the flash tank 48 located downstream of 2nd absorber. Solvent containing substantially all the acid gas together with small amounts of product gas dissolved therein is withdrawn from the bottom of tower 44 thru line 47 and introduced into the flash tank 48 maintained at a lower pressure than tower 44 to effect release of substantially all the product gases dissolved in the solvent which are returned thru line 49 and compressor 51 and line 52 to line 43 and thence into the bottom of tower 44 (Col. 6, line 19-27).

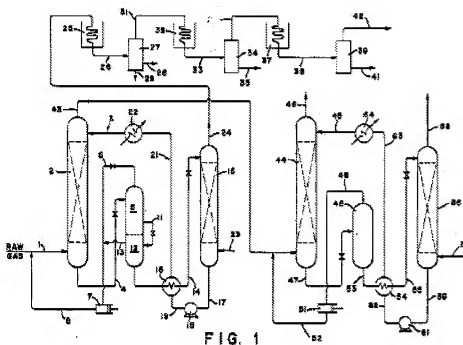


FIG. 1

The advantage of this arrangement is to have product gas containing less than 2 p.p.m. H_2S to be discarded from absorption column 44 thru line 46. The solvent containing dissolved acid gas flows from the bottom of the flash chamber 48 thru line 53 and then heat exchanger 54 wherein it is heated by indirect heat exchanger with lean solvent and thence thru line 55 into the top of stripping column 56 (Col. 6, line 17-32).

Therefore, it would have been obvious at time of the invention to install the flash tank downstream of 2nd absorption stage disclosed by Sweny et al for the 2nd absorption column of Marjanovich et al (US 5820837A) by joining the line 21 in Figure of Marjanovich et al in order to achieve the advantages cited above.

As to the charged absorption substance being heated after the 2nd absorption stage and before entering into the desorption stage whereby the heating takes place in indirect heat exchanger with the absorption substance flow coming from the desorption stage in **claim 2**, as shown in the Figure 1 of Sweny et al above, the heat exchanger 54, which read on the limitation as claimed.

As to absorption taking place at an operating pressure of 10 to 150 bars in **claim 5**, Marjanovich et al (US5820837A) disclose high pressure contact vessel (i.e. about 800-1200 psig) (Col. 3, line 25).

As to the temperature of enriched absorption agent coming from the absorber to be increased to 50 to 200 °C in **claim 6**, Marjanovich et al (US05820837A) disclose high pressure contact vessel at 50 to 120 °F (Col. 3, line 25).

As to the limitations of **claim 8**, the disclosure of Marjanovich et al, Sweny et al, Khanmamedov is incorporated herein by reference, the most subjects as currently claimed, have been recited in Applicant's claim 1 and have been discussed therein, and with the Figure of Sweny et al.

Allowable Subject Matter

(3). **Claim 9** is allowed.

The following is a statement of reasons for the indication of allowable subject matter: the common compressor for both streams is not disclosed by any of the prior art cited above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IVES WU whose telephone number is (571)272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu

Art Unit: 1797

Date: February 10, 2009

/DUANE SMITH/
Supervisory Patent Examiner, Art Unit 1797
2-11-09